

# **R5CE**

## **Universal Monitoring Distribution Amplifier R-series Card Module**

### **User Manual**



**AJA**  
AJA VIDEO SYSTEMS INC

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by AJA Video can effect emission compliance and could void the user's authority to operate this equipment.

## Contacting Support

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To contact AJA Video for sales or support, use any of the following methods:

443 Crown Point Circle, Grass Valley, CA. 95945 USA

Telephone: +1.800.251.4224 or +1.530.274.2048

Fax: +1.530.274.9442

Web: <http://www.aja.com>

Support Email: [support@aja.com](mailto:support@aja.com)

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When calling for support, have all information on the product (serial number etc.) at hand prior to calling.

## Limited Warranty

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AJA Video warrants that this product will be free from defects in materials and workmanship for a period of five years from the date of purchase. If a product proves to be defective during this warranty period, AJA Video, at its option, will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

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## Introduction

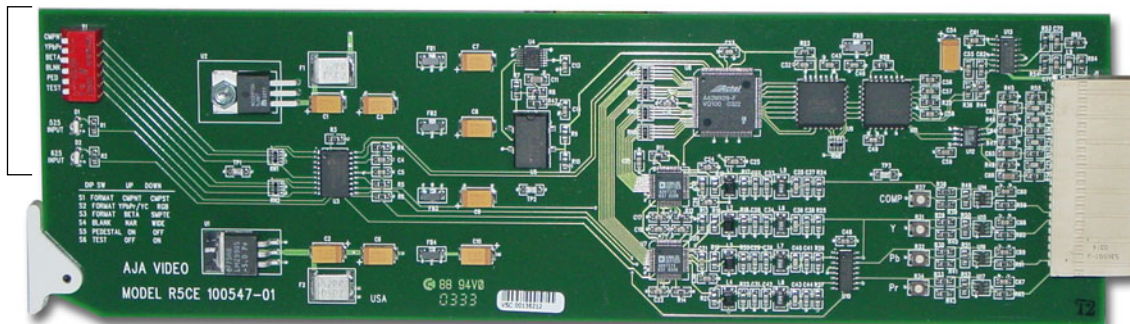
The R5CE SDI monitoring distribution amplifier provides four equalized, re-clocked and separately buffered serial digital outputs, plus four analog monitoring outputs. One analog output is NTSC/PAL. The other three analog outputs are configurable to a wide variety of formats, including composite, composite and Y/C (S Video), or component—including SMPTE/N10 (YUV), RGB, and true Betacam levels.

In operation, the R5CE automatically configures to 525 or 625 line component digital inputs and then outputs analog NTSC (525, line input), PAL (625 line input) and component analog as determined by DIP switch settings. A PLL jitter filter/memory reduces the effects of SDI jitter on the analog outputs. Another exclusive feature of the R5CE is a 10- to 8-bit dithering circuit that removes contouring in the analog outputs.

The R5CE encodes the full dynamic range of input component video—values below black and above white are not clipped. In the NTSC mode, the 7.5 IRE pedestal can be disabled by an external DIP switch selection. The R5CE also features a PLL filter, which reduces SDI input jitter for stable composite or component analog outputs.

## Features

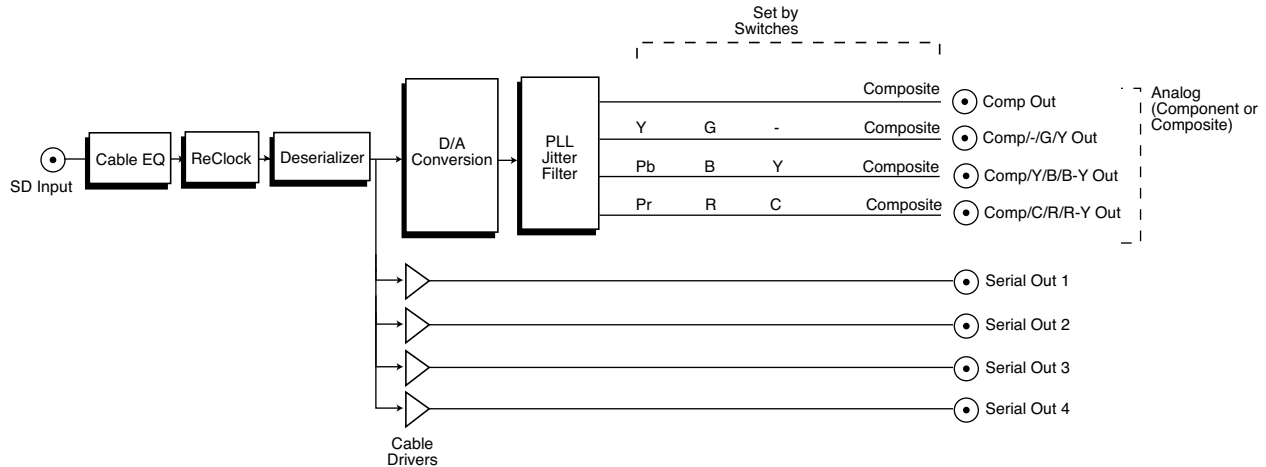
User  
Controls  
and LEDs



### *R5CE Card Module, Side View*

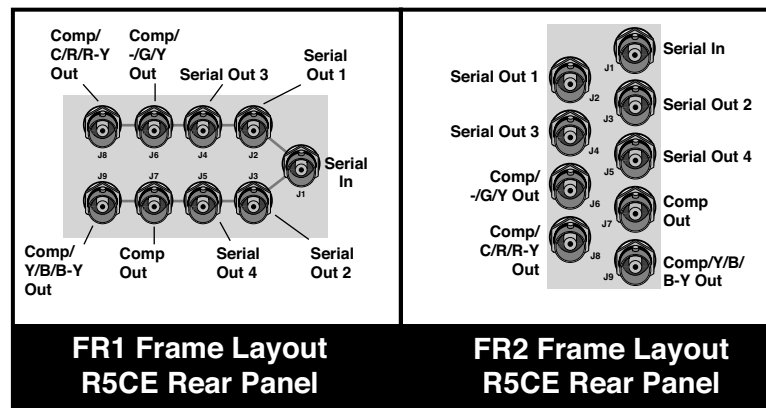
- SDI Input, SMPTE 259M
- Four equalized and re-clocked copies of the SDI input (SMPTE 259M) as outputs
- Four analog outputs (configurable as 4 composite, or 1 composite and R/G/B, Y/Pb/Pr, or Y/C)
- Y/Pb/Pr selectable for SMPTE/EBU levels or Betacam levels (Y, R-Y, B-Y)
- Automatic NTSC/PAL selection
- 10-bit to 8-bit Dithering
- PLL Jitter Filter
- Built-in Test Pattern
- Configurable pedestal and narrow/wide H/V blanking
- Frame Sync/Genlock option with reference input and full timing adjustment~
- Locks composite output Color Framing sequence to external reference without Frame Sync/Genlock option
- Plug compatible with several other manufacturers' video frames
- Compatible with Leitch 6800 Series Frames

## Block Diagram



*R5CE Monitoring Digital DA, Simplified Block Diagram*

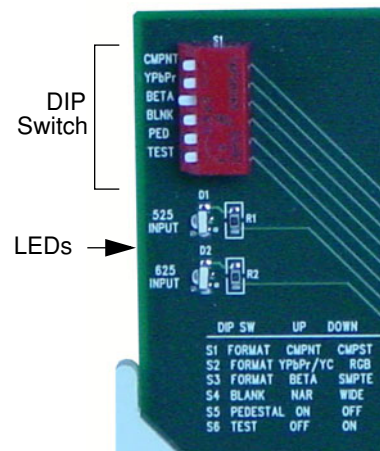
## I/O Connections



*FR1 and FR2 BNC Connector Assignments, R5CE Card Module*

When the R5CE module is installed in an AJA FR1 or FR2 frame, a corresponding group of 9 BNCs on the rear panel then provide I/O for the module. The illustration above shows the connector assignments for both the FR1 and FR2 when used with the R5CE.

## User Controls



The user interface for configuring the R5CE and selecting output formats is a 6-position DIP switch at the front of the card. Two LEDs at the front card additionally show the type of input present (525 or 625), which happens automatically.

The four outputs labeled *Serial Out* 1-4 are always serial digital. They are cable-equalized, and reclocked. The “Comp..” outputs are format configurable via the S1 and S2 DIP switches. All DIP switch functions are described below under *Control Functions*.

## Control Functions

Switch Number	Description	Details
S1 — CMPST or CMPNT	Choose Y/C or Composite Format	CMPNT (UP) = Select component output CMPST (DOWN) = Select composite output
S2 — RGB or YPbPr/YC	Configure Component Output	YPbPr/YC (UP) = Output Y, R-Y, B-Y if SW1 is COMPNT. If SW1 is CMPST, output 1 composite & 1 Y/C  RGB (DOWN) = Output RGB if SW1 is COMPNT. If SW1 is CMPSTE, output 3 composites.
S3 — BETA or SMPTE	Configure Component Levels	BETA (UP) = Selects BETA 525 levels (if configured for Component output)  SMPTE (DOWN) = Selects SMPTE levels (if configured for Component output) NOTE: No effect with 625 input
S4 — NAR or WIDE	Configure Blanking	NAR (Up) = Vertical (line numbers indicate where video starts) line 13, field 1; line 12, field 2 (525 line) line 10, field 1; line 322, field 2 (625 line) Horizontal (active video line durations) ITU-R.470 (720 pixels PAL/NTSC)  WIDE (Down) = Vertical (line numbers indicate where video starts) line 22, field 1; line 21, field 2 (525 line) line 23, field 1; line 335, field 2 (625 line) Horizontal (active video line durations) ITU-R/SMPTE (710 pixels NTSC, 702 pixels PAL)

Switch Number	Description	Details
S5 — PEDESTAL	Set pedestal for Composite outputs (only). Note: there is no effect with 625 input.	ON (UP) = 7.5 IRE pedestal for NTSC OFF (DOWN) = No pedestal for NTSC-J
S6 — TEST	Enable or disable test pattern output	OFF (UP) = Disables internal test signal ON (DOWN) = Selects internal 75% colors bars test signal

## Output Selection Matrix For Output 3 BNCs

The following table shows the combinations of DIP switch settings required to choose output formats for the three configurable output BNCs.

Output Format	DIP Switch #1	DIP Switch #2	DIP Switch #3
3 Composite	CMPSTE	RGB	N/A
1 Composite and 1 Y/C	CMPSTE	YPbPr/YC	N/A
RGB	CMPNT	RGB	N/A
SMPTE component (BETA625)	CMPNT	YPbPr/YC	SMPTE
BETA 525 component	CMPNT	YPbPr/YC	BETA

## Installation

Typically, R5CE installation consists of the following:

1. disconnect power from the frame (remove line cord)
2. remove the FR1/FR2 front panel
3. install R5CE card module
4. apply external color black reference at the frame's External Reference BNC
5. apply power to the frame by connecting a north american-style power cord from the frame to mains power (90 to 260 VAC)

Instructions for removing the frame front door for module installation is discussed in the *FR1/FR2 User Manual*.

## Specifications

Item	Specification
Input:	SDI (SMPTE 259M), BNC
Outputs:	SDI (SMPTE 259M), 4 x BNC NTSC/PAL Analog, 1 x BNC YPbPr - SMPTE, EBU-N10, Betacam RGB, or 3 x NTSC/PAL, or 1 NTSC/PAL and Y/C (S Video) 3 x BNC All outputs are separately buffered
Serial Output:	Equalized, Re-clocked
Jitter Filtering:	Up to 2.5 Hz
Frequency Response:	+/- .25db to 5Mhz frequency response (Y)
2T K factor:	<1% (Y)
Diff. Gain:	<1.5%
Diff. Phase:	<1.5 degree
Output level adjustment: (internal)	+/-20% (internal)
Power Consumption:	+6.5 Volts/8.5 Watts, -6.5 Volts/0 Watts

